

**REMARKS**

Claims 1 through 10 and 16 have been previously canceled. Claims 11 and 19 have been amended. Claims 11 through 15 and 17 through 20 remain in the application.

Claims 11 through 15 and 17 through 20 were rejected under 35 U.S.C. § 103 as being unpatentable over Hutchings (U.S. Patent No. 2,206,356) in view of Gimby (U.S. Patent No. 4,938,254), Feinberg (U.S. Patent No. 3,234,959), and Gakenholz (U.S. Patent No. 3,936,243). Applicant respectfully traverses this rejection.

U.S. Patent No. 2,206,356 to Hutchings discloses a check valve. A valve casing 6 is provided at each end with screw threads to receive an outer member 7 of the unions whose inner members 8 are screwed to the end of pipes 9. A movable valve is constructed of a tubular portion 11 which is made to freely slide in a hole 12 provided in a valve cage 12 which has on one end an outwardly extending flange 14 tightly clamped between the inner member 8 of the union and the end of the valve casing 6. The other end of the valve cage 13 is provided with a valve seat 15 arranged to be engaged by a valve cap 16 rigidly secured to the one end of the tubular portion 11 being provided with a shoulder 17 to serve as a stop against the one end of the valve cage 13. A plurality of holes 19 are shown through the tubular portion 11 a considerable distance from the valve cap 16 and fibre washer 20 which form a free passage for the fluid within the tubular portion 11 to enter the interior of the valve casing 6 when the valve is in a considerable open position. Hutchings does not disclose a fuel pump having a valve housing adapted to be disposed in an outlet member of a fuel pump and a valve seat formed on an interior surface of the valve housing and having a generally frusta-conical cross-sectional shape. Hutchings also does not disclose a valve member with a single outlet port disposed below a groove thereof and located axially between a valve seat and one end of a valve housing when the

valve member is in a closed position to prevent fuel flow and to allow fuel flow when the valve member is in an open position.

U.S. Patent No. 4,938,254 to Gimby discloses an over-pressure relief valve. A fuel valve 10 has a valve member 12 which is positioned within the opening O and which is reciprocable within the opening O along the central axis of the opening O. The valve member 12 has a first end 14, which is positioned adjacent to an outside face of the vessel V, and a second end 16, which is positioned within the vessel V. The valve member 12 has a part toroidal recess 18 positioned adjacent to the first end thereof, and the valve member 12 carries an elastomeric O-ring 20 which is retained in the recess 18. Gimby does not disclose a fuel pump having a valve member with a single outlet port disposed below a groove thereof and located axially between a valve seat and one end of a valve housing when the valve member is in a closed position to prevent fuel flow and to allow fuel flow when the valve member is in an open position.

U.S. Patent No. 3,234,959 to Feinberg discloses a checking valve device. A valve has a casing 10 and a pair of tubular coupling members 14,15 screwed into access openings 12,13 of the casing 10. A pair of tubular sleeve members 28,29 is positioned within the casing 10 before the coupling members 14,15 are screwed in place. A pair of fluid discharge orifices 35,36 is formed in the side walls of the sleeve members 28,29 upwardly from the closed ends of those members to provide separate fluid passages through the valve. Feinberg does not disclose a fuel pump including a valve housing disposed in an outlet member, a valve seat formed on an interior surface of the valve housing, a valve member disposed in the valve housing and having an end adjacent the valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end, and a seal disposed in the groove for contacting the valve seat. Feinberg also does not disclose a fuel pump including a spring disposed about the valve member

and located axially between the valve seat and one end of the valve housing to urge the valve member toward the valve seat. Feinberg further does not disclose a fuel pump including a valve member with a single outlet port disposed below a groove thereof and located axially between a valve seat and one end of a valve housing when the valve member is in a closed position to prevent fuel flow and to allow fuel flow when the valve member is in an open position.

U.S. Patent No. 3,936,243 to Gakenholz discloses a fuel pump. The pump includes an open ended first tubular housing part 10 engaged within an oppositely facing open ended second tubular housing part 11. The second housing part 11 abuts against a collar 10a of the first housing part 10 and is secured thereto. The first part 11 tapers at its other end forming a frusto conical portion 12 and it terminates in a tubular extension 13. Extension 13 and first housing part 10 carry respective bearings 14 and 15, in which an armature shaft 16 of an electric motor is mounted. Shaft 16 carries an armature 17 and an armature winding. A valve 29 is provided in a flange fitting 33 of the housing member 10 which also carries the electrical connections for the electric motor. Gakenholz does not disclose a fuel pump including a valve member with a single outlet port disposed below a groove thereof and located axially between a valve seat and one end of a valve housing when the valve member is in a closed position to prevent fuel flow and to allow fuel flow when the valve member is in an open position.

In contradistinction, claim 11, as amended, clarifies the invention claimed as a fuel pump including an outlet member having a first passageway therethrough and a valve housing disposed in the first passageway of the outlet member. The fuel pump also includes a valve seat formed on an interior surface of the valve housing and having a generally frusto-conical cross-sectional shape. The fuel pump includes a valve member disposed in the valve housing and having an end adjacent the valve seat with an annular groove having a generally

circular cross-sectional shape extending radially into the end and including a seal disposed in the groove. The valve member has a closed position in which the seal engages the valve seat to prevent fuel from flowing through the outlet member and an open position to allow fuel to flow through the outlet member. The fuel pump further includes a spring disposed about the valve member and located axially between the valve seat and one end of the valve housing to urge the valve member toward the valve seat. The valve member has a single outlet port disposed below the groove and located axially between the valve seat and the one end of the valve housing when the valve member is in the closed position to prevent fuel flow and to allow fuel flow when the valve member is in the open position.

The United States Court of Appeals for the Federal Circuit (CAFC) has stated in determining the propriety of a rejection under 35 U.S.C. § 103, it is well settled that the obviousness of an invention cannot be established by combining the teachings of the prior art absent some teaching, suggestion or incentive supporting the combination. See In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1985); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 U.S.P.Q. 929 (Fed. Cir. 1984). The law followed by our court of review and the Board of Patent Appeals and Interferences is that “[a] prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art.” In re Rinehart, 531 F.2d 1048, 1051, 189 U.S.P.Q. 143, 147 (C.C.P.A. 1976). See also In re Lalu, 747 F.2d 703, 705, 223 U.S.P.Q. 1257, 1258 (Fed. Cir. 1984) (“In determining whether a case of prima facie obviousness exists, it is necessary to ascertain whether the prior art teachings would appear to be

sufficient to one of ordinary skill in the art to suggest making the claimed substitution or other modification.”)

None of the references cited, either alone or in combination, teaches or suggests the claimed invention of claims 11 through 15, 17, and 18. Specifically, Hutchings ‘356 merely discloses a check valve having a plurality of holes through a tubular portion a considerable distance from a valve cap and fibre washer which form a free passage for the fluid within the tubular portion to enter the interior of a valve casing when the valve is in a considerable open position. Hutchings ‘356 lacks a valve housing adapted to be disposed in an outlet member of a fuel pump and a valve seat formed on an interior surface of the valve housing and having a generally frusta-conical cross-sectional shape. Hutchings ‘356 also lacks a valve member having a single outlet port to allow flow from the valve member when the valve member is in the open position. In Hutchings ‘356, a valve casing 6 is provided at each end with screw threads to receive an outer member 7 of the unions whose inner members 8 are screwed to the end of pipes 9 and a movable valve is clamped between the inner member 8 of the union and the end of the valve casing 6 and not disposed in an outlet member of a fuel pump.

Gimby ‘254 merely discloses an over-pressure relief valve in which a valve member is reciprocable within an opening and has a first end with a part toroidal recess and an elastomeric O-ring retained in the recess. Gimby ‘254 lacks a fuel pump having a valve member with a single outlet port disposed below a groove thereof and located axially between a valve seat and the one end of a valve housing when the valve member is in a closed position to prevent fuel flow and to allow fuel flow when the valve member is in an open position. In Gimby ‘245, there is a pair of radial openings 28 and 30 in the valve member 12.

Feinberg '959 merely discloses a valve checking device having a casing, a pair of tubular coupling members, a pair of tubular sleeve members positioned within the casing before the coupling members are screwed in place, and a pair of fluid discharge orifices formed in the side walls of the sleeve members. Feinberg '959 lacks a fuel pump including a valve housing disposed in an outlet member, a valve seat formed on an interior surface of the valve housing, a valve member disposed in the valve housing and having an end adjacent the valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end, and a seal disposed in the groove for contacting the valve seat. Feinberg '959 also lacks a fuel pump including a spring disposed about the valve member and located axially between the valve seat and one end of the valve housing to urge the valve member toward the valve seat. Feinberg '959 further lacks a fuel pump including a valve member with a single outlet port disposed below a groove thereof and located axially between a valve seat and one end of a valve housing when the valve member is in a closed position to prevent fuel flow and to allow fuel flow when the valve member is in an open position.

Gakenholz '243 merely discloses a fuel pump having a valve in a flange fitting of a housing member. Gakenholz '243 lacks a fuel pump including a valve member with a single outlet port disposed below a groove thereof and located axially between a valve seat and one end of a valve housing when the valve member is in a closed position to prevent fuel flow and to allow fuel flow when the valve member is in an open position. In Gakenholz '243, there is no valve member with a single outlet port disposed below a groove thereof. As such, there is no suggestion or motivation in the art for combining Hutchings '356, Gimby '254, Feinberg '959, and Gakenholz '243 together.

It is not sufficient for an examiner merely to state that one reference teaches several of the limitations of a claim and another teaches several limitations of a claim to support a rejection based on obviousness. This approach ignores a cornerstone principal of patent law:

That all elements of an invention may have been old (the normal situation), or some old and some new, or all new, is however, simply irrelevant. Virtually all inventions are combinations and virtually are combinations of old elements. Environmental Designs v. Union Oil Co. of Cal., 713 F.2d 693, 698 (Fed. Cir. 1983) (other citations omitted).

Here, the Hutchings '356, Gimby '254, Feinberg '959, and Gakenholz '243 references, skirt around, but do not suggest the claimed invention *as a whole*. The analysis advanced by the examiner here focuses on the obviousness of substitutions and differences instead of on the invention, *as a whole*, and is an over- simplification of the difficult determination of obviousness. See, Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1383 (Fed. Cir. 1986). Further it is respectfully submitted that the Examiner is picking and choosing elements from the structurally dissimilar devices disclosed in the Hutchings '356, Gimby '254, Feinberg '959, and Gakenholz '243 patents and combining these elements by restructuring them, using hindsight and the Applicant's own disclosure, to conclude that the claimed invention is obvious. This is improper. There is a fundamental axiom in patent law that if a reference must be reconstructed or rearranged to change its operation to meet the Applicant's claim, that modification of the reference is inappropriate and cannot stand. Furthermore, obviousness is not established by combining the basic disclosures of the prior art to produce the claimed invention absent a teaching or suggestion that the combination be made. Interconnect Planning Corp. v. Fiel, 774 F.2d 1132, 1143, 227 U.S.P.Q. (BNA) 543, 551 (Fed. Cir. 1985); In re Corkhill, 771 F.2d 1496, 1501-1502, 226 U.S.P.Q. (BNA) 1005, 1009-10 (Fed. Cir. 1985).

As disclosed in the Background of the Invention section of the present application, eddy currents tend to create a low pressure on one side of a pintel of a check valve having two outlet ports being opposed or 180 degrees apart. This low-pressure area causes the pintel to tip toward this low pressure. Once the pintel moves toward the low-pressure area, the low-pressure area alternates to the opposite side of the pintel. This causes the pintel to immediately move back one hundred eighty degrees (180°) from its original direction of travel. As a result, the pintel is constantly trying to reach positional equilibrium, causing the pintel to oscillate and produce objectionable noise. This unique problem was solved by Applicant by providing a valve member with a single outlet port disposed below a groove thereof and located axially between a valve seat and the one end of a valve housing when the valve member is in a closed position to prevent fuel flow and to allow fuel flow when the valve member is in an open position.

Even if these references could be combined, neither teaches a fuel pump having a valve member with a single outlet port disposed below a groove thereof and located axially between a valve seat and the one end of a valve housing when the valve member is in a closed position to prevent fuel flow and to allow fuel flow when the valve member is in an open position. Applicant is not attacking the references individually, but is clearly pointing out that each reference is deficient and, if combined (although Applicant maintains that they are not combinable), the combination is deficient. The present invention sets forth a unique and non-obvious combination of a fuel pump including a check valve having a mono-port on the pintel, which reduces oscillations and objectionable noise. The references, if combinable, fail to teach or suggest the combination of a fuel pump including an outlet member having a first passageway therethrough, a valve housing disposed in the first passageway of the outlet member, a valve seat formed on an interior surface of the valve housing and a valve seat formed on an interior surface



of the valve housing and having a generally frusta-conical cross-sectional shape, a valve member disposed in the valve housing and having an end adjacent the valve seat with an annular groove, a spring disposed about the valve member and located axially between the valve seat and one end of the valve housing to urge the valve member toward the valve seat, the valve member having a single outlet port disposed below the groove and located axially between the valve seat and the one end of the valve housing when the valve member is in the closed position to prevent fuel flow and to allow fuel flow when the valve member is in the open position as claimed by Applicants.

Further, the CAFC has held that “[t]he mere fact that prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification”. In re Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). The Examiner has failed to show how the prior art suggested the desirability of modification to achieve Applicant’s invention. Thus, the Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claims 11 through 15, 17, and 18 are allowable over the rejection under 35 U.S.C. § 103.

As to claim 19, claim 19, as amended, clarifies the invention claimed as a fuel pump including a pump section at one axial end, a motor section adjacent the pump section, and an outlet section adjacent the motor section at the other axial end. The outlet section includes an outlet member having a passageway therethrough, a valve housing disposed in the passageway of the outlet member, and a valve seat formed on an interior surface of the valve housing and having a generally frusta-conical cross-sectional shape. The fuel pump also includes a valve member disposed in the valve housing and having an end adjacent the valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end and including a

seal disposed in the groove. The valve member has a flow port extending axially from an inlet into one end thereof. The fuel pump includes a spring disposed about the valve member and located between the inlet and the valve seat to urge the valve member toward the valve seat in a closed position in which the seal engages the valve seat to prevent fuel from flowing through the outlet member. The valve member has a single outlet port extending diametrically therethrough and communicating with the flow port and located axially between the valve seat and one end of the valve housing when the valve member is in the closed position to prevent fuel flow and to allow fuel flow from the outlet port when the valve member is in an open position to allow fuel to flow through the outlet member.

None of the references cited, either alone or in combination, teaches or suggests the claimed invention of claim 19. Specifically, Hutchings '356 merely discloses a check valve having a plurality of holes through a tubular portion a considerable distance from a valve cap and fibre washer which form a free passage for the fluid within the tubular portion to enter the interior of a valve casing when the valve is in a considerable open position. Hutchings '356 lacks a fuel pump having a generally frusta-conical cross-sectional shape. Hutchings '356 also lacks a valve member with a single outlet port extending diametrically therethrough and communicating with the flow port and located axially between the valve seat and one end of the valve housing when the valve member is in the closed position to prevent fuel flow and to allow fuel flow from the outlet port when the valve member is in an open position to allow fuel to flow through the outlet member. In Hutchings '356, a valve casing 6 is provided at each end with screw threads to receive an outer member 7 of the unions whose inner members 8 are screwed to the end of pipes 9 and a movable valve is clamped between the inner member 8 of the union and the end of the valve casing 6 and not disposed in an outlet member of a fuel pump.

Gimby '254 merely discloses an over-pressure relief valve in which a valve member is reciprocable within an opening and has a first end with a part toroidal recess and an elastomeric O-ring retained in the recess. Gimby '254 lacks a fuel pump having a valve member with a single outlet port extending diametrically therethrough and communicating with the flow port and located axially between the valve seat and one end of the valve housing when the valve member is in the closed position to prevent fuel flow and to allow fuel flow from the outlet port when the valve member is in an open position to allow fuel to flow through the outlet member. In Gimby '245, there is a pair of radial openings 28 and 30 in the valve member 12.

Feinberg '959 merely discloses a valve checking device having a casing, a pair of tubular coupling members, a pair of tubular sleeve members positioned within the casing before the coupling members are screwed in place, and a pair of fluid discharge orifices formed in the side walls of the sleeve members. Feinberg '959 lacks a fuel pump including a valve housing disposed in an outlet member, a valve seat formed on an interior surface of the valve housing, a valve member disposed in the valve housing and having an end adjacent the valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end, and a seal disposed in the groove for contacting the valve seat. Feinberg '959 also lacks a fuel pump including a spring disposed about the valve member and located axially between the valve seat and one end of the valve housing to urge the valve member toward the valve seat. Feinberg '959 further lacks a fuel pump including a valve member with a single outlet port extending diametrically therethrough and communicating with the flow port and located axially between the valve seat and one end of the valve housing when the valve member is in the closed position to prevent fuel flow and to allow fuel flow from the outlet port when the valve member is in an open position to allow fuel to flow through the outlet member. In Feinberg '959, a pair of springs

33, 34 are disposed axially on the opposite side of the valve seat of the sleeve members 28,29 from the discharge orifices 35,36 to reduce or prevent the oscillations and the discharge orifices 35,36 do not stop oscillations.

Gakenholz '243 merely discloses a fuel pump having a valve in a flange fitting of a housing member. Gakenholz '243 lacks a fuel pump including a valve member with a single outlet port extending diametrically therethrough and communicating with the flow port and located axially between the valve seat and one end of the valve housing when the valve member is in the closed position to prevent fuel flow and to allow fuel flow from the outlet port when the valve member is in an open position to allow fuel to flow through the outlet member. In Gakenholz '243, there is no valve member with a single outlet port disposed below a groove thereof. As such, there is no suggestion or motivation in the art for combining Hutchings '356, Gimby '254, Feinberg '959, and Gakenholz '243 together.

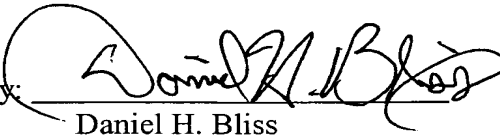
The present invention sets forth a unique and non-obvious combination of a fuel pump including a check valve having a mono-port on the pintel, which reduces oscillations and objectionable noise. The references, if combinable, fail to teach or suggest the combination of a fuel pump including a pump section at one axial end, a motor section adjacent the pump section, an outlet section adjacent the motor section at the other axial end, the outlet section including an outlet member having a passageway therethrough, a valve housing disposed in the passageway of the outlet member, a valve seat formed on an interior surface of the valve housing and having a generally frusta-conical cross-sectional shape, a valve member disposed in the valve housing having a flow port extending axially from an inlet into one end thereof, a spring disposed about the valve member and located between the inlet and the valve seat to urge the valve member toward the valve seat in a closed position, the valve member having a single outlet port extending

diametrically therethrough and communicating with the flow port and located axially between the valve seat and one end of the valve housing when the valve member is in the closed position to prevent fuel flow and to allow fuel flow from the outlet port when the valve member is in an open position to allow fuel to flow through the outlet member as claimed by Applicants. Thus, the Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 19 and the claims dependent therefrom are allowable over the rejection under 35 U.S.C. § 103.

Obviousness under § 103 is a legal conclusion based on factual evidence (In re Fine, 837 F.2d 1071, 1073, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988), and the subjective opinion of the Examiner as to what is or is not obvious, without evidence in support thereof, does not suffice. Since the Examiner has not provided a sufficient factual basis, which is supportive of his/her position (see In re Warner, 379 F.2d 1011, 1017, 154 U.S.P.Q. 173, 178 (C.C.P.A. 1967), cert. denied, 389 U.S. 1057 (1968)), the rejection of claims 11 through 15 and 17 through 20 is improper. Therefore, it is respectfully submitted that claims 11 through 15 and 17 through 20 are allowable over the rejection under 35 U.S.C. § 103.

Based on the above, it is respectfully submitted that the claims are in a condition for allowance or in better form for appeal. Applicants respectfully request reconsideration of the claims and withdrawal of the final rejection. It is respectfully requested that this Amendment be entered under 37 C.F.R. 1.116.

Respectfully submitted,

By:   
Daniel H. Bliss  
Reg. No. 32,398

Delphi Technologies, Inc.  
Legal Staff – Intellectual Property  
P.O. Box 5052  
Troy, Michigan 48007  
(248) 813-1214

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